

CLAIMS

1. A series hybrid electric vehicle comprising:
 - an engine;
 - an n-phase generator driven by said engine;
 - 5 a rectifier generating a direct voltage from an n-phase alternating voltage received from said n-phase generator;
 - a battery charged with said direct voltage;
 - a motor driving a drive wheel;
 - 10 an inverter driving said motor on said direct voltage received from said rectifier and/or a direct voltage received from said battery; and
 - a switch,
- wherein said n-phase generator includes n armature
15 windings each having a first end connected to a common neutral point,
- wherein said rectifier includes:
 - a negative terminal;
 - a positive terminal on which a potential higher
20 than that on said negative terminal is generated; and
 - n rectifying arms,
- wherein each of said n rectifying arms comprises:
 - a first diode connected between said negative
terminal and an intermediate node connected to second end
25 of corresponding one of said n armature windings; and
 - a second diode connected between said
intermediate node and said positive terminal, and

wherein said switch is connected between said neutral point and said negative terminal.

2. The series hybrid electric vehicle according to claim 1, wherein said switch electrically connects or disconnects said neutral point and said negative terminal in response to a revolution speed of said engine.

3. The series hybrid electric vehicle according to claim 2, further comprising control means for controlling the engine revolution speed of said engine,

wherein, when said engine revolution speed is about to exceed a first revolution speed, said control means decreases said engine revolution speed down to a third revolution speed lower than said first revolution speed, and said switch electrically connects said neutral point and said negative terminal, and then said control means increases said engine revolution speed up to a second revolution speed higher than said first revolution speed.

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4. The series hybrid electric vehicle according to claim 3, wherein, when said engine revolution speed is decreased from said second revolution speed and is about to reach said first revolution speed, said control means decreases the revolution speed of said engine down to a fourth revolution speed lower than said first revolution speed, and said switch electrically disconnects said

neutral point and said negative terminal, and then said control means increases said engine revolution speed up to said first revolution speed.

- 5 5. A series hybrid electric vehicle comprising:
 an engine;
 a three-phase generator driven by said engine;
 a rectifier generating a direct voltage from a
three-phase voltage received from said three-phase
10 generator;
 a battery charged with said direct voltage;
 a motor driving a drive wheel;
 an inverter driving said motor on said direct
voltage received from said rectifier and/or a direct
15 voltage received from said battery; and
 a star-delta switch mechanism,
 wherein said three-phase generator includes three
armature windings, and
 wherein said star-delta switch mechanism connects
20 said armature windings in selected one of a star connection
and a delta connection.

6. The series hybrid electric vehicle according to
claim 5, wherein said star-delta switch mechanism is
25 responsive to a revolution speed of said engine for
connecting said armature windings in selected one of said
star connection and said delta connection.

7. The series hybrid electric vehicle according to claim 6, wherein, when the revolution speed of said engine is about to exceed a first revolution speed, said control
5 means decreases said engine revolution speed down to a third revolution speed lower than said first revolution speed, and said star-delta switch mechanism connects said armature windings in said delta connection, and then said control means increases said engine revolution speed up
10 to a second revolution speed higher than said first revolution speed.

8. The series hybrid electric vehicle according to claim 7, wherein, when said engine revolution speed is
15 decreased from said second revolution speed and is about to reach said first revolution speed, said control means decreases the revolution speed of said engine down to a fourth revolution speed lower than said first revolution speed, and said star-delta switch mechanism connects said
20 armature windings in said star connection, and then said control means increases said engine revolution speed up to said first revolution speed.

9. The series hybrid electric vehicle according to any
25 one of claims 1 to 8, wherein said drive wheels and said motors are plurally prepared,
wherein said motors drives said drive wheels,

respectively,

wherein each of said motors includes:

a rotor connected to a corresponding one of said drive wheels;

5 a stator having a plurality of slots circumferenced and spaced at constant intervals,

wherein said rotor comprises:

a rotor core; and

permanent magnets constituting a field magnet
10 system,

wherein said rotor has a rotor side face facing said stator,

wherein said permanent magnets have a pole face outward in a radial direction of said rotor;

15 wherein a maximum value x of a distance from a point on said pole face to said rotor side face satisfies the following equation:

$$x \leq D / 10, \text{ and}$$

$$D = 2\pi r / n_1,$$

20 where r is a radius of said rotor core, and n_1 is a number of poles of said field magnet system.